

REMARKS

In response to the Office Action dated December 13, 2002, Applicants respectfully request entry of the above amendments and reconsideration and allowance of the claims.

Claims 3, 4, 12, 17, 19, 20, 21, 22, and 31 have been canceled without prejudice. Claims 1-2, 9-11, 13-16, 25, 26, 28, 30, and 33-36 are pending.

The Examiner has objected to the specification because of a typographical error. Applicants have corrected this error and respectfully request that the Examiner withdraw this objection.

Claims 1-4, 9-17, 19-22, 25, 26, 28, 30, 31 and 33-36 stand rejected under 35 U.S.C. 112, second paragraph. Applicants have addressed each of the Examiner's comments in the present amendment. More specifically, claim 1 has been amended to recite that the converter is operable as a motor and as a generator and that the converter (the interactive rotary connection thereof) is operable in at least two operating modes that have associated therewith at least two rpm ratios. Applicants believe that this clarifies the subject matter that the Examiner was previously questioning. Claim 14 has been amended so that it is now consistent with claim 1.

With respect to the terms "upstream" and "downstream", Applicants respectfully traverse this ground of rejection since the relative positions/locations of the various elements are clear from the claim language. Claim 1 recites that the first clutch is

placed in the torque flow path at one of an upstream location and a downstream location relative to the first transfer elements. As one of skill the art understands an upstream location within the torque flow path is at a location toward the torque generating location or drive source (driving part location) as opposed to a downstream location which is a torque consuming location (driven part location). Thus, when the first clutch is upstream relative to the first transfer elements, the first clutch is closer to the drive source (torque generation source) compared to the first transfer elements. The converse is true when it is in a downstream location. Based on the foregoing, Applicants respectfully submit that the language of claim 1 is not confusing and withdrawal of this ground of rejection is in order.

Claims 1, 2, 4, 9, 10, 11, 14, 17, 20 and 36 stand rejected under 35 U.S.C. 102(e) as being anticipated by Tabata et al. Claims 1-4 and 9-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita et al. in view of Maucher et al. Claims 15 and 16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. Claims 19, 21, 22, 25, 26, 28, 30, 31, 33-35 stand rejected under Tabata et al. in view of Fujita et al.

Tabata et al. shows an electro-mechanical energy converter arranged in the transmission in concentric alignment with the crankshaft, which can be brought into a cooperative connection with the transmission input shaft and thus with the crankshaft. What is not disclosed is an arrangement parallel to the crankshaft, an arrangement at the end of the crankshaft, two selectable transmission ratios, each of which is engaged through a freewheeling clutch.

Fujita et al. discloses a motor that serves on the one hand to start the engine and on the other hand to operate the vehicle through a reverse gear. A function where the motor operates as a current generator is not described. Furthermore, the arrangement at one side of the crankshaft is not disclosed.

Maucher et al. discloses an electro-mechanical energy converter that is arranged to concentrically surround the crankshaft and that is not connected to the crankshaft by means of a gear stage of the transmission. Thus, this reference lacks the features of an arrangement of the electro-mechanical energy parallel to the crankshaft, rotary conversion by means of at least two transmission ratios dependent on operating mode, selection of the two transmission ratios dependent on the positions of two freewheeling clutches.

Applicants have amended claim 1 to incorporate the features of previous dependent claims 3, 4, 12, 17, 19, and 22. Based on the Examiner's previous comments, all three references would need to be combined together in order to reject the newly formed claim 1. It should be noted that the three prior art references relate to generically different inventions and that when two documents are combined with each other, at least two features from the third document have to be combined. This by itself requires an inventive step as there are at least several features that are not suggested by the reference and therefore precludes a rendering that the claim is unpatentable.

The person skilled in the art of Fujita et al. will in no way be led by a knowledge of Maucher et al to invent the proposed starter/generator, because he will find

no suggestion as to how an electro-mechanical energy converter could be used as a motor- and generator unit, because the generator mode does not work in the illustrated example. If the motor is running in the direction B, both of the freewheeling clutches are overrun. Thus, a starter/generator arranged in the place of the starter motor 2 would in this case not be driven at all. The skilled-in-the-art person will therefore have to perform two inventive steps at once, namely the step from Maucher's concentric starter/generator to a starter/generator arranged parallel to the crankshaft, and the step of optimizing the free-wheeling clutches in such a manner that the electro-mechanical energy converter is actually being driven when the combustion engine is running. Applicants respectfully submit that there is simply a lack of motivation or contemplation within the cited references for the power train in newly formulated claim 1 to be realized.

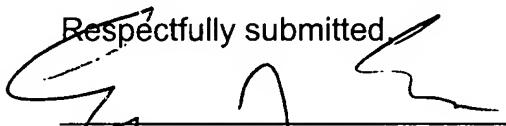
Based on a combination of Tabata et al. with Fujita et al., the skilled-in-the-art person would try to build a hybrid drive inside the transmission by means of a planetary gear mechanism, or to configure a reverse-gear stage by means of a planetary gear mechanism. In either case, the skilled-in-the-art person finds no suggestion of the present invention in accordance with new formulated claim 1.

In other words, amended claim 1 contains one or more features that are neither disclosed nor suggested by a combination of the cited references and therefore, the rejections should be withdrawn.

Claims 2, 9-11, 13-16, 25, 26, 28, 30, and 33-36 should be allowed as depending from what should be an allowed independent claim 1, as amended.

It is believed that this amendment is fully responsive to the outstanding Office Action. Should the Examiner believe that direct contact with Applicant's attorney would advance prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

Respectfully submitted,



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MARKED UP COPY OF THE SPECIFICATION AND CLAIMS

IN THE SPECIFICATION:

Page 58, please amend the second full paragraph as follows:

The gears 967a, 968a of the pairs 967, 968 are rotationally fixed on the belt-pulley shaft 965, while the second gears 967b, 968b are connected to the driving shaft 903 through the overrunning clutches 920, 922 with opposite overrunning directions. The housing 915 surrounds the [rotaqry] rotary transfer device 909 and is supported on the shaft 903 by means of roller bearings 936a, 936b.

IN THE CLAIMS:

1. (Amended) A power train for a motor vehicle, said power train comprising a combustion engine with a driving shaft turning at a first rpm rate, at least one torque-coupling device, a transmission with a transmission input shaft, and at least one electro-mechanical energy converter with an energy-converter shaft turning at a second rpm rate, said electro-mechanical energy converter being operable [at least] as a motor and as a generator and having an interactive rotary connection to the driving shaft; wherein the interactive rotary connection has at least two rpm ratios defined as quotients of the first rpm rate divided by the second rpm rate, and wherein the at least two rpm ratios automatically set themselves according to which of at least two operating modes the

electro-mechanical energy converter is working in, said at least two operating modes comprising a start-up mode and a driving mode, wherein the driving shaft has a front end facing away from the transmission and the interactive rotary connection is arranged at said front end, wherein the driving shaft has a first rotary axis and the electro-mechanical energy converter has a second rotary axis, and wherein said first and second rotary axes are substantially parallel to each other, wherein during a start-up phase of the combustion engine, the second rpm rate is higher than the first rpm rate, wherein the interactive rotary connection comprises at least one rotary transfer device arranged between the electro-mechanical energy converter and the combustion engine, the at least one rotary transfer device comprising a gear mechanism with stationary gear shafts and at least two gear pairs and at least two overrunning clutches for engaging and disengaging the different rpm ratios.

13. (Amended) The power train of claim [12] 1, wherein the rpm ration for the start-up phase is between 2:3 and 1:10.

14. (Amended) The power train of claim 1, wherein under [a first mode of the at least two] one of the start-up and driving operating modes the torque flows from the electro-mechanical energy converter to the combustion energy, and under [a second mode of the at least two] the other of the start-up and driving operating modes the torque flows from the combustion engine to the electro-mechanical energy converter.

25. (Amended) The power train of claim [17] 1, wherein the interactive rotary connection further comprises at least one fixed-ratio rotary transfer device.

30. (Amended) The power train of claim [17] 1, wherein the two overrunning clutches comprise [at least one rotary transfer device further comprises] a first overrunning clutch is located in a first torque flow path that is operative under the first mode, and a second overrunning clutch located in a second torque flow path [that] is operative under the second mode, and wherein the first clutch is engaged in the first mode and disengaged in the second mode, while the second clutch is engaged in the second mode and disengaged in the first mode.

36. (Amended) The power train of claim [17] 1, wherein the rotary transfer device is arranged on one of the driving shaft and the transmission input shaft.